DOCUMENT RESUME

ED 326 104 HE 024 004

AUTHOR Dey, Eric L.
TITLE Dimensions of Faculty Stress: Evidence from a Recent National Survey. ASHE Annual Meeting Paper.
PUB DATE Nov 90
NOTE 22p.; Paper presented at the Annual Meeting of the Association for the Study of Higher Education (Portland, OR, November 1-4, 1990).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Black Colleges; Black Teachers; Church Related Colleges; *College Faculty; Comparative Analysis; Full Time Faculty; Higher Education; *Institutional Characteristics; National Surveys; Nontenured Faculty; Private Colleges; Public Colleges; Selective Colleges; Sex Differences; *Stress Variables; *Tenure; Two Year Colleges; Whites
IDENTIFIERS *ASHE Annual Meeting

ABSTRACT

A study of college faculty stressors attempted to address limitations in previous research by extending the variables measured to include both on- and off-campus sources of stress and by testing the implicit assumption that all faculty perceive the same dimensions of stress, albeit at different levels. Data were drawn from a 1989-90 national survey of 93,479 full-time faculty in 400 institutions. From this total, 51,574 usable responses were received, a number which was later refined down to 35,478 full time faculty and 392 institutions. This total was then divided into 8 groups, from each of which a random sample of 491 was drawn yielding a final sample size for this study of 3,928. Faculty variables considered include tenure, sex, race (white or non-white), institutional selectivity (low, medium, high), and sector (private, public, non-sectarian, Catholic, Protestant, and two- and four-year). Results indicate that different groups of tenured faculty perceive varying levels and dimensions of stress. The largest differences across groups were found in "subtle discrimination." It was also found that men and women perceive household responsibility stress similarly, although men express it less frequently. Methodological implications for stress research are considered. The findings' implications for institutional policy include differential faculty development emphases and a need for increased and more creative institutional efforts at stress reduction. Includes 14 references. (MSE)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED326104

Dimensions of Faculty Stress: Evidence from a Recent National Survey

A Paper Presented at the Annual Meeting of the Association for the Study of Higher Education

Portland, Oregon
November 4, 1990

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

ASHE

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

HE 024 004

Eric L. Dey

Higher Education Research Institute
Graduate School of Education
University of California, Los Angeles
Los Angeles, CA 90024-1521
213/825-1925
ebolged@uclamvs.bitnet

Texas A&M University
Department of Educational
Administration
College Station, TX 77843
(409) 845-0393

ASSOCIATION FOR THE STUDY OF HIGHER EDUCATION

This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Red Lion-Jantzen Beach in Portland, Oregon, November 1-4, 1990. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

Dimensions of Faculty Stress: Evidence from a Recent National Survey

While there is a good deal of research on occupational stress, there is only a limited amount of research on dimensions of stress among college faculty. The existing research on college faculty stress has focused primarily upon stressors within the work environment. In reviewing the literature on college faculty, Finkelstein (1984) found that researchers have focused on two basic sources of faculty stress: structural (i.e., career–based fluctuations in faculty circumstance) and organizational (i.e., institutional and disciplinary demands placed on faculty).

The work of Gmelch, Lovrich, and Wilke (1984) provides an illustrative example of faculty stress research. Gmelch et al. focus on (a) identifying stressful job situations, (b) studying these stressors in relation to research, teaching, and service activities, and (c) examining disciplinary differences in sources of stress. Among other findings, Gmelch et al. report that time and resource constraints were among the top stressors, that disciplinary differences in sources of stress were small, and that teaching was more stressful than research or service activities. Although well executed, limitations in the Gmelch et al. study are illustrative of limitations in faculty stress research generally.

First, the Gmelch et al. study focuses on a very limited set of faculty roles (i.e., teaching, research, and service) and institutional contexts (i.e., disciplinary settings) that roughly correspond to Finkelstein's structural and organizational sources of stress. In reality, college faculty typically take on a multiplicity of roles within broader work and social contexts. Thus, a broader framework within which to study faculty roles and contexts would be preferable. In addition, it should be recognized that stress also comes from a variety of sources *outside* the work place. Focusing exclusively upon issues within the collegiate environment artificially represents the stressors facing faculty members. Roles outside the college environment *per se* (i.e., family, society) can dramatically influence stress within the college environment since they represent constraints upon faculty time and energy (Astin & Davis, 1985; Hensel, 1988). Finally, no attention is paid to individual or group differences in perceived sources of stress. For example, women and minorities may perceive institutional sexism and racism as sources of stress—sources that may not be recognized by their white male colleagues.

Since most faculty stress studies focus exclusively upon testing mean differences in stress (for example, do untenured faculty feel more stress than tenured faculty? Do faculty with higher teaching loads have higher stress?), an untested assumption is that different faculty groups perceive the same types, or dimensions, of stress. In statistical parlance, this is a question of factorial invariance across groups (Alwin & Jackson, 1981; Byrne, Shavelson, & Muthén, 1989). Say, for example, that untenured faculty see tenure and promotion policies as a source of stress while their tenured colleagues do not. If this is the case, performing a factor analysis on data that includes both junior and senior faculty would likely yield artifactual results—results that would not accurately represent the stressors perceived by either group.

This study attempts to directly address several limitations in the existing faculty stress research. First, the stress measures used in this study are not limited exclusively to on–campus stressors. Instead, a broader set of items measuring off–campus sources of stress (such as family obligations and health concerns) is included in the analysis. Secondly, the implicit assumption that all faculty perceive the same dimensions of stress (albeit at different levels) will be explicitly tested.

Confirmatory factor analytic techniques (CFA; Jöreskog, 1971) will be used to test whether different groups of faculty perceive the same stress dimensions.

Method

Data Source

Data used in this study are from a recent national survey of college faculty and administrators conducted by the Higher Education Research Institute (HERI) in the Fall and Winter of 1989–90. The results reported here are based on the responses of full–time faculty members at nearly 400 colleges and universities throughout the United States.

The survey questionnaire used to collect the data analyzed here was designed for a national study of the outcomes of general education programs sponsored by the Exxon Education Foundation. Although the original Exxon grant was designed to study a selected sample of 53 institutions comprising a diverse set of approaches to general education (see Dey, Hurtado, & Astin, 1989), the omnibus nature of the survey instrument prompted a decision to invite other institutions across the country to participate in the survey for a nominal fee. Letters of invitation to participate in the survey were subsequently sent to the chief academic officers at some 2,500 other institutions. This invitation prompted an additional 379 institutions to agree to administer the faculty survey (HERI, in press).

The chief executive officer (or other high–ranking administrator) at each institution wrote a covering letter to the survey encouraging response, and the institution provided HERI with a current, up–to–date list of faculty addresses. Of the 93,479 surveys mailed out, useable returns were eventually received from 51,574 after two waves of mailing, a response rate of 55 percent. A comparison of the HERI data and data from a national faculty survey conducted in 1988 by the National Center for Educational Statistics (NCES, 1990) suggests that the HERI sample adequately represents the teaching faculty in terms of age, race, academic rank, and highest degree held (see Appendix A, HERI, in press).

The sample for this study was further refined by limiting the analysis to the responses of full–time undergraduate teaching faculty. (For this study, a 'faculty member' is defined as any full–time employee of an accredited college or university who spends at least part of his or her time teaching undergraduates. Although academic administrators were also surveyed, only those who reported spending at least some time teaching undergraduates were included in these analyses.). Additionally, 40 of the 432 institutions who originally agreed to participate either did not administer the survey as planned or had a low response rate thus bringing into question the representativeness of the respondents (and thus were excluded from the sample). The final sample included the responses of 35,478 full–time faculty at 392 two–year colleges, four–year colleges, and universities. Table 1 summarizes the distribution of institutional participants and faculty respondents by stratification cell, representing the various types of institutions within the higher education system (HERI, in press).

Analysis

To study differences in stress across groups, I defined eight groups based on faculty responses to three dichotomous variables: tenure status, race (white versus nonwhite), and gender. Although additional groups could logically be developed based on individual (e.g., marital status, dependent children) or organizational (e.g., rank, discipline, institutional type) characteristics, I decided to limit the number of groups to be studied in this initial attempt to explore differences in the dimensions of perceived stress. To simplify the study of group differences (covariance structure modelling procedures such as confirmatory factor analysis are sensitive to differences in sample size), I developed a balanced sample of faculty responses. Table 2 shows the number of respondents per group found in the set of data that represents full–time faculty. Nonwhite tenured females have the smallest representation in the sample (n = 491, or 1.38 percent). Thus, a random sample of 491 was drawn from each group, yielding a final sample size of 3,928.

Dimensions of faculty stress were assessed using the responses to 18 potential sources of stress. Faculty were asked the extent to which the areas had been a source of stress within the past two years. Respondents were asked to rate each one on a three–point scale: not at all, somewhat, or extensive. These items are shown in Table 3. An inspection of the skew and kurtosis estimates for these observed measures indicate that they are not normally distributed, especially those that may not apply to all faculty (e.g., parents, commuters, etc.). It is unclear what effect the apparent nonnormality of the data may have. In addition, it should be recognized that no claim is being made that these items adequately represent the universe of potential faculty stressors. Nevertheless, these items reflect a broader range of potential stressors than is typically considered in faculty stress research.

Crosstabular analyses were used to study group differences in responses to individual stress items. A series of exploratory and confirmatory factor analyses were used to study underlying stress dimensions among the measured stress items.

Results

Group Differences

The crosstabular analyses, using the items shown in Table 3, show that there are large differences among the eight groups under study in terms of the prevalence of stressors. Table 4 shows the percentages of faculty in each of the groups that report each of the items as having been an extensive source of stress within the past two years. Time pressures and lack of personal time are by far the most common sources of stress for the faculty in the sample. These results are consistent with the findings of Gmelch et al. (1984) who report that time constraints are a major source of faculty stress. While these two items were rated as being extensive stressors by the highest percentage of faculty in each of the eight groups, it is interesting to note that there are still large differences across groups. For example, well over one–half (56%) of the white tenured females versus only about one–third (35%) of the white tenured male faculty report that time pressure is an extensive source of stress. Similar differences emerge among the other groups as well. On average, men tend to report less time stress than do women (35 versus 52% for time pressure, 31 versus 49% for lack of personal time, for men and women respectively), nonwhites report time stress less frequently than do whites (38 versus 48% for time pressure, 37 versus 43% for lack of personal time, for nonwhites and whites respectively), and untenured faculty report time

stress more frequently than tenured (45 versus 42% for time pressure, 42 versus 38% for lack of personal time, for untenured and tenured faculty respectively).

After time stress, the next most commonly reported sources of stress are faculty teaching loads, research or publishing demands, and review/promotion process concerns. While large differences occur across groups once again, the pattern differs from that described above. When considering teaching load concerns, for example, women are more likely to report this as a source of extensive stress than are men (27 versus 22%). This is especially true of tenured women, who are one–third more likely to report this as an extensive source of stress than are tenured men (27 versus 18%). As before, untenured faculty are more likely to report that teaching loads were an extensive source of stress (26 versus 22%). There are, however, only slight differences across racial groups (25 versus 24% for whites and nonwhites respectively). Similar patterns are found for research or publishing stress and review/promotion process concerns.

Nearly one–fifth (19%) of all faculty mentioned that managing household responsibilities were an extensive source of stress, making it the most common source of stress emanating from outside the work place. Given prevailing social roles it is not surprising to note that women are considerably more likely to cite this is an extensive stressor than are men. This is especially true among the tenured faculty, where women are nearly twice as likely (21 versus 11%) to report extensive stress. The differences between men and women are smaller among untenured faculty (who are on average younger), which possibly suggests shifting gender roles related to household tasks—despite this small shift, women are still about one–third more likely than are men to report extensive stress from managing household responsibilities (26 versus 18).

Overall, subtle discrimination is the seventh most commonly reported stressor. As might be expected, extremely large differences are found across groups. Nonwhite women are, for example, about five times as likely as white men (23 versus 5%) to report this as an extensive stressor. Similarly, when compared to white men, white women and nonwhite men are about two and three times as likely, respectively, to cite this as an extensive source of stress. Given these large differences, it seems reasonable to suggest that research that omits measures of perceived discrimination would be underestimating the amount (and types) of stress for women and minority faculty.

Some interesting patterns emerge when considering the remaining stress items. For example, committee work, colleagues, and faculty meetings are the only campus–based sources of stress where tenured faculty are more likely to report stress than are untenured faculty.[1] It may be that tenured faculty report stress more frequently because of their long–term commitment to the institution, whereas the junior faculty perceive their lack of tenure as a potential opportunity to change institutions (and in doing so, change colleagues). Fund–raising expectations are fairly equal across groups, with the notable exception of nonwhite males. Although it is unclear what may cause this effect, it is striking to note that this is true for tenured and untenured faculty. This may be a fertile area for future research.

---

[1]Tenured faculty are also more likely to report stress related to care of elderly parent, physical health and concern over children's problems, most probably due their higher average age. Age differences among tenured and untenured faculty may also account for the relatively infrequent reporting of child–care stress among the tenured faculty.

Before considering the underlying dimensions of stress, it is interesting to note how observed measures of stress relate to faculty activities. Table 5 shows how three on–campus stressors (teaching load, research or publishing demands, and committee work) relate to the amount of time faculty report spending in these activities. Teaching load–based stress, for example, generally increases as time spent teaching increases. Untenured white females are the most likely to report stress and also have the highest teaching load. Similarly, tenured white males are the least likely to report teaching load stress and while having a low number of scheduled teaching hours per week.[2]

An opposite relationship is found when considering research activities: the less time faculty spend doing research on average, the more likely it is that research will be seen as a source of stress. Women, for example, report spending about half as much time per week performing research or scholarly writing than do men (3.6 versus 6.7 hours) yet are more likely to report extensive stress (24 versus 21%). Similarly, untenured faculty report spending slightly less time per week in research activities (5.0 versus 5.3 hours), yet they are more likely to report stress related to research (27 versus 18%) then are tenured faculty. Despite this general pattern, it is interesting to note that gender difference in research–related stress is smaller among untenured faculty (6% gender difference among tenured faculty versus 1% among untenured faculty), even though the time spent in research is similar for both groups (tenured women spend 3.3 hours less per week versus 3.0 hours less per week for untenured women). This discrepancy may be related to differences in the reward structures tenured and untenured faculty: compared to untenured faculty (whose livelihood may be dependent upon receiving tenure), research productivity for tenured faculty is tied to achieving the 'goodies' of academe (such as prestige, salary, honors, and resources). Thus, tenured women may be more likely to feel stress from research activities since they are attempting to achieve parity with the rewards given to men; in contrast, untenured faculty are simply trying to attain job security—thus men and women are more likely to report similar levels of stress.

Finally, women are almost twice as likely to report extensive stress than are men (16 versus 9%), even though on average they report spending only about one–half hour more per week in committee work and meetings (2.2 versus 1.8 hours). This may indicate that men and women may perceive the 'verbal jousting' that traditionally occurs in faculty meetings and committees in very different ways and, unfortunately, more frequently with extensive stress.

Although the results presented above demonstrate that the eight groups being considered in this study differ in terms of the prevalence of extensive stress on the items included in the recent HERI survey, we have not yet considered whether these items have similar relationships across groups. In order to answer this question, several factor analyses were undertaken. In the first stage, exploratory factor analysis (EFA) was used to identify general dimensions of stress among tenured faculty. (The untenured faculty were excluded from these multivariate analyses because

---

[2] A curious exception to this pattern is found among untenured nonwhite faculty, who are slightly more likely than average to report extensive teaching stress, yet have low teaching loads (equivalent to those of tenured faculty). One possible explanation for this may be found in Table 4, which shows that untenured minority faculty are more likely than any other group to report that students are an extensive source of stress. It may be that nonwhite faculty are more likely than others to spend more time out of class working with students, thereby negating whatever advantage a lower teaching load might bring. Clearly, this is an important area for future research.

they differed significantly from tenured faculty in terms of certain variables such as child–care, care of elderly parents, etc. Subsequent studies will focus on the stresses perceived by the groups excluded in these analyses). The EFA results were used in a series of subsequent confirmatory factor analyses (CFA) to test whether the factors identified in the entire group exist in each of the subgroups. Specifically, I sought to test the invariance of factor loadings across groups. This condition is an important test of factor invariance, for "if the observed variables are measuring the same factors in each of the groups, the regression of the variables on the factors, the factor loadings, ought to be the same" (Bentler, 1989, p. 151). If factor loadings are not the same across groups, this would suggest that different groups of faculty constitute different populations, and perceive different *types* of stress, not simply different *levels* of stress.

Dimensions of Stress

A series of preliminary EFAs were conducted using all 18 stress items included in the survey (missing data was deleted listwise). An inspection of communality[3] estimates across solutions with varying numbers of factors indicated that several items had extremely low communalities ($h^2 < .10$) and should be deleted from the analysis: these were health problems, long–distance commuting, care of elderly parent, and marital friction.

A second series of EFAs (using the principal axis factor method for extraction with oblique rotations) were conducted using the 14 remaining variables. Of these, the four factor solution was most interpretable. In essence, the items loading upon each of the four factors could be logically supported and were consistent in their direction of loading. The variables that marked these four factors were then used in the series of CFAs described below.

In a CFA, it is necessary to specify a *priori* which variables will be related to which factors (see Bollen, 1989, for a discussion of the practical and theoretical differences between EFA and CFA). In using the EFA results as a guide, I selected only those variables with factor loadings exceeding .25 and specified these factor loadings to be estimated. This model, which is depicted in Figure 1, is relatively 'pure' in the sense that only one variable (colleagues) loaded on more than one factor. Since I was interested in comparing across groups, the same model was tested without any modification for the five samples (i.e., all tenured faculty, white males, white females, nonwhite males, and nonwhite females). In order to maximize model fit, correlations among the measured–variable residuals were added to the model on the basis of a Lagrange multiplier modification index on residual matrices (Bentler & Chou, 1986). Thus, small discrepancies between the hypothesized model and the observed data can be explained without substantively altering the factor model being tested (Sörbom, 1974).

Table 6 summarizes the model fit for each of the groups under study. While the model fit (i.e., a measure of how well the tested model explains the relationships found among the observed variables) for each CFA increases with the inclusion of correlated residuals, it is hard to assess the adequacy of the of model fit using significance level associated with the χ^2 test (the power of the χ^2 test is partially dependent upon sample size—see Bollen, 1989). However, the normed fit index (NFI; Bentler, 1989) can be used to assess the relative fit of the models. The NFI measures

[3]A variable's communality is the "proportion of its variance that can be accounted for by the common factors" (Gorsuch, 1983, p. 29).

the proportional reduction in χ^2 values between the model being tested and a very restricted baseline model.[4] NFI values range from 0 to l; the closer NFI is to one, the better the model fit.

An examination of NFI values shows that the model fits best for the entire data set (NFI = 9.66). This is not surprising given that the model being tested was developed using the same data (it should be remembered however that the CFAs were based upon covariance matrices while the EFAs were based upon corresponding correlation matrices). The model fit for the four subgroups is not as good, with the model fitting best for nonwhite females (NFI = .911) and worst for white females (NFI = .885). Since the NFI values for each of the groups are similar and each approaches or exceeds .9 (see Bentler, 1989, p. 93), the model fit seems to be equally adequate for the four subgroups. While it would possible to test this conclusion statistically, the lack of 'statistical' fit for each of the subgroups as indicated by the χ^2 test makes it unlikely that a simultaneous multigroup analysis would yield any additional insights.

The question of equal factor loadings across groups is addressed directly by the data in Table 7. These data show that while there is some similarity in factor loadings across groups, there are also large differences. These differences are an indication that the different groups perceive different stress dimensions. For example, Factor I, which I have labelled time constraints, shows that the factor loading for the three variables that mark this factor are roughly equal for nonwhite males. In contrast, the loading for the other three groups show a different pattern: lack of personal time and time pressures are more closely related (by a factor of 2) to this factor than is teaching load. This suggests that for nonwhite men, teaching load is more likely to be related to time–based stress than it is for other tenured faculty.

In contrast, the loadings for Factor II (home responsibilities) have more stability across groups. The loading of the household responsibilities, child–care, and children's problems variables on this factor are roughly proportional across groups. This indicates that the four groups perceive stress to home responsibilities in similar ways, although, as suggested by Table 4, in widely varying amounts.

Factor III (institutional governance) has a slightly less stable pattern of loadings across groups than does Factor II, yet there is also rough similarity across groups. For example, in each of the four groups colleague–based stress has a low factor loading relative to the other variables marking this factor. With the exception of the white males, the loadings of the faculty meeting and committee work items are roughly proportional. White males reverse the pattern established by the other three groups (i.e., committee work is more closely related to the factor than is the faculty meeting items), suggesting that faculty meetings are more closely related to this stress dimension for white males. On the whole, however, this factor seems to be fairly invariant across groups.

The final factor, labelled promotion concerns, shows little stability across groups. Although research or publishing demands has the highest loading across all four groups, the similarity appears to end there. For example, review/promotion stress has higher loadings than student stress for all groups but white males. For the nonwhite groups the loadings of these two items on the factors are roughly equal. For white females however, the review/promotion item has

---

[4] A common baseline model in factor analysis "is one that suggests that no factors underlie the observed variables and that the covariances (or correlations) between observed indicators are zero in the population" (Bollen, 1989, p. 270).

an appreciably higher loading. These differences are most probably related to differences in rank found among the subgroups in the sample, with white males having the highest average rank.

Larger differences across groups are found on the loading for the subtle discrimination item: the loading is dramatically smaller for white males than it is for any of the other three groups, which suggests that white males do not see subtle discrimination as being related to promotion issues. Finally, the lone substantial loading for nonwhite males seems to indicate that this group, and this group only, sees colleagues as a source of promotion stress.

Given the differences in factor loadings across groups, it seems reasonable to conclude that the same factors do not exist for each of the groups. This conclusion is further supported by the data shown in Table 8. If the same dimensions of stress existed across groups, one would expect to see similar correlations among the factors across groups. Table 8 shows that this is not the case: the correlations among factors across groups vary dramatically. For example, the correlation between the home responsibility and institutional governance factors is moderate for nonwhite males (r = .218) and nonwhite females (r = .297) while being quite low for white males (r = .046). While the other inter–factor correlations are more stable across groups, they nonetheless differ enough to strongly suggest that the factors are not invariant among tenured faculty.

Conclusions, Implications, and Limitations

These results presented here indicate that in addition to different groups of tenured faculty perceiving varying levels of stress, these faculty groups also appear to perceive different dimensions of stress. Although there are similarities in the factor loadings across groups, these similarities are not so striking as to suggest that faculty groups perceive the same stress dimensions. These results, showing that there are different constructs of stress across groups, show that the groups selected for comparison come from distinct populations and therefore merit separate investigations.

The largest differences in loadings (as well as differences in the amount of stress) across groups is found with the 'subtle discrimination' item. White males, not surprisingly, do not perceive this as a source of stress to any great degree. The same cannot be said of the other groups: women and minorities report that subtle discrimination produces a high rate of stress (nonwhite women report extensive stress related to subtle discrimination at five times the rate reported by white males). Although some might argue that discrimination does not 'really' exist, this argument misses the point: whether it is a 'perception' or a 'reality' does not matter, women and minorities feel a tremendous amount of unnecessary stress due to subtle discrimination.

Another interesting finding is related to household stress. While we might expect men and women to perceive household and child care responsibility stressors differently, the data show that men seem to perceive these responsibilities in similar ways, although women report this as a source with a much greater frequency. In short, although men perceive these responsibilities in the same way women do, they feel less stressed by them. Perhaps this is because traditional social roles still permit men to opt out of attending to these responsibilities, which likely leads to higher stress among women.

These results have several methodological and practical implications. First, researchers should strive to take a more expansive look at different kinds of stressors. Although the items used in this study covered a much broader domain than is typically the case in faculty research

studies, these items do not exhaust the range of possible stressors. Researchers should explore additional stressors that might have relevance for different groups of faculty.

Additionally, researchers should develop and test explicit models of stress rather than simply relying on exploratory factor analytic techniques. Recent advances in statistical modelling techniques can easily be applied to problems related to faculty stress. Where possible, these advances should be used to complement more traditional analytical techniques.

These results also have implication for institutional policy. Given that different groups perceive different kinds of stress, professional development programs should be developed that explicitly recognize and attempt to deal with stress differences, both within and outside academe. For example, programs could be developed to work to eliminate the racism and sexism that subtle discrimination causes for minorities and women, especially in the promotion process. By doing so, colleges can help reduce unnecessary stress and therefore develop a more productive faculty.

Colleges and universities could also strive to eliminate other sources of stress. For example, institutions could be more aggressive in providing child care opportunities for faculty, thus reducing an important source of faculty stress, especially among women. By working hard to eliminate the obvious causes of stress, institutions can avoid having to deal with its consequences in the form of attrition of women and minority faculty.

In developing new programs and services, institutions should strive to be creative in developing stress reduction (and avoidance) programs. Rather than taking a 'one size fits all' approach, institutions should pay attention to the stressors that affect different groups of faculty (this study has shown that they perceive different stressors; future research will help document what these differences are). While these result of such creative thinking might be viewed as nontraditional, it should be remembered that many of the faculty who have unique concerns about stress are also nontraditional. Given this, it should not be surprising that new programs are needed to deal with the new challenges these faculty present.

References

Alwin, D. F., & Jackson, D. J. (1981). Applications of simultaneous factor analysis to issues of factorial invariance. In D. D. Jackson & E. P. Borgatta (Eds.), *Factor analysis and measurement in sociological research: A multidimensional perspective* (pp. 249–280). Beverly Hills, CA: Sage.

Astin, H. S., & Davis, D. (1985). Research productivity across the life and career cycles: Facilitators and barriers for women. In M. F. Fox (Ed.), *Scholarly writing and publishing: Issues, problems and solutions*. Boulder, CO: Westview.

Bentler, P. M. (1989). *EQS: Structural equations program manual*. Los Angeles: BMDP Statistical Software.

Bentler, P. M., & Chou, C.-P. (1986, April). *Statistics for parameter expansion and contraction in structural model*. Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.

Byrne, B.M., Shavelson, R.J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105(1),* 456–466.

Dey, E.L., Hurtado, S., & Astin, A. W. (1989, November). *Varieties of General Education Programs*. Paper presented at the meeting of the Association for the Study of Higher Education, Atlanta, GA.

Finkelstein, M.J. (1984). *The American academic profession*. Columbus, OH: Ohio State University Press.

Gmelch, W. H., Lovrich, N. P., & Wilke, P.L. (1984). Sources of stress in academe: A national perspective. *Research in Higher Education,* 20(4), 477–490.

Hensel, N. (1989). Resolving the conflict: Parenting and Professorship. *Thought and Action,* 5(2), 7 1–94.

Higher Educational Research Institute. (In press). *The American College Teacher*. Los Angeles, CA: Higher Education Research Institute, UCLA.

Jöreskog, K. G. (1971). Simultaneous factor analysis in several populations. *Psychometrika, 36,* 409–426.

National Center for Educational Statistics. (1990). *Faculty in Higher Education Institutions, 1988*. Contractor Report. Data Series DR–NS OPF–87/88–1.27. Washington, DC: NCES.

Sörbom, D. (1974). A general method for studying differences in factor means and factor structures between groups. *British Journal of Mathematical and Statistical Psychology, 27,* 229–239.

Table 1
Institutional and Faculty Participation in the 1989 HERI Faculty Survey, by Stratification Cell

Stratification Cell	Institutions		Faculty	
	Total	Participating	Total	Respondents
Public universities				
Low selectivity	56	13	39,298	4,609
Medium selectivity	38	4	38,779	1,363
High selectivity	23	6	23,083	1,779
Private universities				
Low selectivity	25	5	10,355	1,146
Medium selectivity	19	2	10,637	338
High selectivity	25	4	15,790	745
Public four-year colleges				
Low selectivity[1]	209	36	46,871	3,700
Medium selectivity	96	18	34,276	2,920
High selectivity	42	8	14,533	1,343
Nonsectarian four-year colleges				
Low selectivity[1]	183	19	9,369	935
Medium selectivity	61	10	6,737	523
High selectivity	83	28	8,254	1,969
Very high selectivity	48	16	6,892	1,382
Catholic four-year colleges				
Low selectivity[1]	81	18	4,420	853
Medium selectivity	59	16	4,713	933
High selectivity	33	7	3,857	526
Protestant four-year colleges				
Low selectivity[1]	218	35	11,566	1,557
Medium selectivity	70	20	5,620	1,068
High selectivity	46	21	4,778	1,474
Two-year colleges				
Public	866	85	84,674	5,351
Private	132	4	3,578	116
Black colleges				
Public	59	5	9,634	357
Private	56	12	3,717	491
All institutions	2,528	392	401,431	35,478

[1]Includes institutions of unknown selectivity
Note: Adapted from HERI, 1990.

Table 2
Distribution of Respondents Among Full-time Faculty in the 1989 HERI Faculty Survey, by Tenure Status, Race, and Gender

Group	Number of Respondents	Percentage of sample
Tenured faculty		
White males	16,423	46.3
White females	4,559	12.9
Nonwhite males	1,313	3.7
Nonwhite females	491	1.4
Untenured faculty		
White males	6,313	17.8
White females	4,811	13.6
Nonwhite males	950	2.7
Nonwhite females	618	1.7
All faculty	35,478	100.1

Table 3
Summary of Variable Characteristics

Stressor	Mean	Standard Deviation	Skewness	Kurtosis	Percent Missing
Managing household responsibilities	1.86	.71	.21	-1.00	13%
Child Care	1.41	.67	1.34	.47	13%
Care of elderly parent	1.32	.60	1.74	1.82	14%
My physical health	1.44	.61	1.06	.09	12%
Review/promotion process	1.74	.78	.50	-1.20	12%
Subtle discrimination including prejudice, racism, sexism	1.58	.72	.83	-.63	13%
Long-distance commuting	1.26	.57	2.09	3.14	12%
Committee work	1.69	.68	.48	-.79	12%
Faculty meetings	1.61	.66	.64	-.64	12%
Colleagues	1.65	.68	.58	-.76	12%
Students	1.59	.62	.54	-.62	13%
Research or publishing demands	1.84	.76	.28	-1.23	12%
Fund-raising expectations	1.28	.57	1.89	2.48	13%
Teaching load	1.93	.75	.12	-1.22	12%
Children's problems	1.35	.60	1.50	1.15	15%
Marital friction	1.30	.57	1.75	2.03	14%
Time pressures	2.29	.71	-.48	-.92	11%
Lack of personal time	2.23	.73	-.39	-1.04	11%

Note. Faculty were asked to indicate the extent to which each had been a source of stress during the past two years: Extensive = 3; Somewhat = 2; Not at all = 1.

Table 4

Percent of Faculty Rating Area as an Extensive Source of Stress, by Tenure Status, Race, and Gender

		Tenured Faculty				Untenured Faculty			
		White		Nonwhite		White		Nonwhite	
Stressor	All	Male	Female	Male	Female	Male	Female	Male	Female
Time pressures	43	35	56	29	48	44	58	31	45
Lack of personal time	40	29	51	27	44	38	54	30	47
Teaching load	24	17	27	19	26	25	29	25	26
Research or publishing demands	22	13	19	18	22	24	27	28	28
Review/promotion process	21	12	17	18	20	25	27	24	26
Managing household responsibilities	19	12	21	11	21	18	28	18	24
Subtle discrimination including prejudice, racism, sexism	14	4	13	17	23	5	13	14	23
Committee work	12	11	21	10	19	7	11	6	13
Colleagues	12	11	16	13	14	10	12	7	13
Child Care	10	5	10	7	10	10	15	11	13
Faculty meetings	9	9	14	10	13	6	9	6	8
Students	7	4	5	7	7	7	7	8	10
My physical health	7	6	8	6	7	5	8	4	8
Long-distance commuting	7	2	6	3	9	6	11	7	12
Care of elderly parent	7	8	12	6	11	5	7	3	5
Marital friction	6	5	5	5	6	7	7	7	7
Children's problems	6	7	7	5	6	5	7	4	8
Fund-raising expectations	6	5	4	10	6	7	4	10	4

Table 5
Selected Sources of Extensive Stress with Time Spent in Activity, by Tenure Status, Race, and Gender

Item	All	Tenured Faculty				Untenured Faculty			
		White		Nonwhite		White		Nonwhite	
		Male	Female	Male	Female	Male	Female	Male	Female
Stressor: Teaching load	24	17	27	19	26	25	29	25	26
Hours/week[1] scheduled teaching	8.0	7.4	7.9	7.3	7.7	9.2	9.3	7.5	7.9
Stressor: Research or publishing demands	22	13	19	18	22	24	27	28	28
Hours/week[1] performing research and scholarly writing	5.2	6.5	3.6	7.4	3.8	5.7	3.4	7.3	3.6
Stressor: Committee work	12	11	21	10	19	7	11	6	13
Hours/week[1] committee work and meetings	2.0	2.1	2.6	2.2	2.5	1.5	1.7	1.2	2.1

[1]Estimated from variable mean.

Table 6
Summary of Model-Fit Statistics, by Group

Model	χ^2	*df*	Normed fit index
All tenured faculty			
Initial CFA	572.58	58	.905
Final CFA	252.91	52	.966
Tenured white males			
Initial CFA	182.83	58	.847
Final CFA	110.50	54	.908
Tenured white females			
Initial CFA	190.13	58	.839
Final CFA	135.64	54	.885
Tenured nonwhite males			
Initial CFA	161.34	58	.875
Final CFA	127.22	57	.901
Tenured nonwhite females			
Initial CFA	184.34	58	.868
Final CFA	123.29	55	.911

Notes. CFA = confirmatory factor analysis. The difference between initial and final model *df*'s indicates the number of correlated residual variables. All p values < .001.

Table 7
Standardized Factor Loadings, by Group (Tenured Faculty Only)

Stressor	All	White		Nonwhite	
		Male	Female	Male	Female
Factor I: Time contraints					
Lack of personal time	.793	.833	.832	.510	.807
Time pressures	.787	.872	.780	.584	.879
Teaching load	.501	.420	.326	.525	.381
Factor II: Home responsibilities					
Managing household responsibilities	.904	.765	.843	.779	.868
Child Care	.571	.556	.613	.666	.607
Children's problems	.402	.393	.486	.438	.437
Factor III: Institutional governance					
Faculty meetings	.769	.892	.611	.776	.684
Committee work	.697	.551	.753	.790	.791
Colleagues	.305	.353	.291	.255	.306
Factor IV: Promotion concerns					
Research or publishing demands	.476	.468	.536	.566	.618
Review/promotion process	.427	.272	.534	.484	.397
Students	.393	.401	.147	.436	.333
Subtle discrimination including prejudice, racism, sexism	.363	.068	.326	.417	.400
Colleagues	.261	.172	.123	.363	.192

Note. Colleague-stress was allowed to load on Factors III & IV. All other variables were constrained to load on one factor only (i.e., all other loadings were constrained to zero).

Table 8
Correlations Among Factors, by Group (Tenured Faculty Only)

Factor pair	All	White		Nonwhite	
		Male	Female	Male	Female
F1, F2	.566	.567	.447	.584	.489
F1, F3	.449	.152	.445	.684	.481
F1, F4	.701	.614	.392	.646	.617
F2, F3	.173	.046	.120	.218	.297
F2, F4	.444	.493	.255	.384	.448
F3, F4	.520	.369	.418	.323	.445

Note. F1 = Factor I: Time contraints; F2 = Factor II: Home responsibilities; F3 = Factor III: Institutional governance; F4 = Factor IV: Promotion concerns.

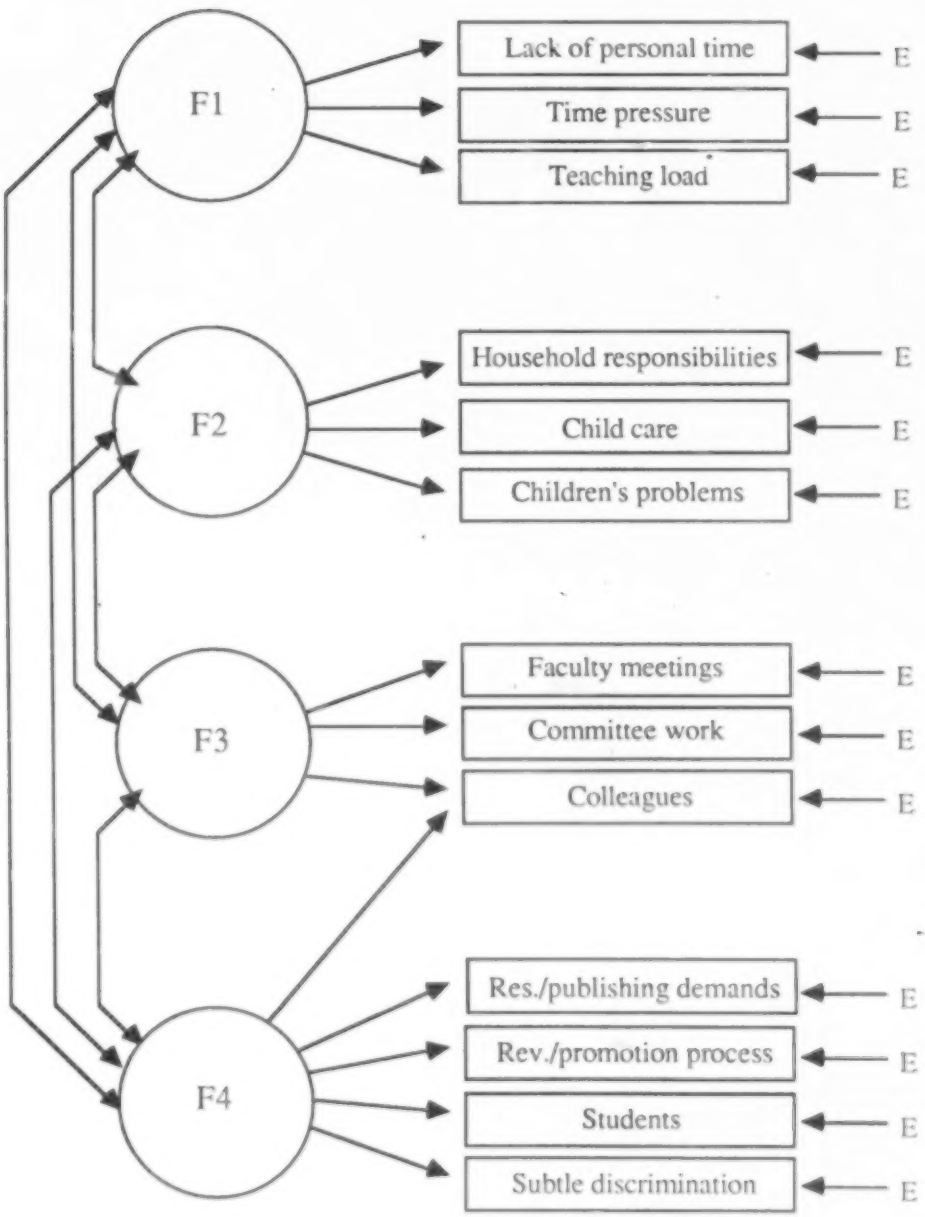

Figure 1. Initial confirmatory factor analysis model. (Circles represent latent constructs [factors], rectangles are measured variables, and 'E' indicates residual variances. Factor loadings are indicated by single headed arrows, covariances among factors are indicated by two-headed arrows.)